

### Info Tech 9/10 Assignment 5: Using Excel to Generate Sequences of Numbers

1. **An Arithmetic Sequence:** is a set of numbers which has a constant difference between terms. For example, if the first term ( $A_1$ ) is 1 and the difference between terms is 2, the second term ( $A_2$ ) will be  $1+2 = 3$  and the third term ( $A_3$ ) will be  $3 + 2 = 5$ .

Using an Excel Workbook, please find the 20<sup>th</sup> and 100<sup>th</sup> term of the following Arithmetic Sequence:

- A. 2,6,10,14,18,22, ...
- B. -1, 10,21,32,43,54,...
- C. 3, 0,-3,-6,-9,-12,..

Note: Put your work in a worksheet called “Arithmetic Sequence”.

2. **A Geometric Sequence:** is a sequence of numbers that follow a pattern of multiplying a fixed number from one term to the next like the following ones:

**Sequence A:** 1, 2 , 4 , 8 , 16 , ...

If we multiply by 2 to the first number we will get the second number. This works for any pair of consecutive numbers. The second number times 2 is the third number:  $2 \times 2 = 4$ , and so on.

**Sequence B:** 0.01 , 0.06 , 0.36 , 2.16 , 12.96 , ...

If we multiply by 6 to the first number we will get the second number. This also works for any pair of consecutive numbers. The third number times 6 is the fourth number:  $0.36 \times 6 = 2.16$ , this will work throughout the entire sequence.

**Sequence C:** 16 , -8 , 4 , -2 , 1 , ...

We need to multiply by  $-1/2$  to the first number to get the second number. This too works for any pair of consecutive numbers. The fourth number times  $-1/2$  is the fifth number:  $-2 \times -1/2 = 1$ .

Using an Excel Workbook, please find the 20<sup>th</sup> and 100<sup>th</sup> term of the following above geometric sequences.

Note: Put your work in a worksheet called “Geometric Sequence”.

3. **Fibonacci sequence:** is the sequence, in which each number is the sum of the two previous numbers: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377... (Except for the first two terms)

Using an Excel Workbook, please find the 20<sup>th</sup> and 100<sup>th</sup> term of the following Arithmetic Sequence.

Note: Put your work in a worksheet called “Fibonacci Sequence”.

4. **Bonus Question:** Consider the geometric sequence 1, 2, 4, 8, 16, ... This sequence has what is called a **common ration** of 2. That is, if any term is divided by the term before it it will always produce a ratio of 2. Now consider Fibonacci sequence 1, 1, 2, 3, 5, 8, 13, ... Does it have a *commonish* ratio?

Use a Excel spreadsheet to find out the answer.